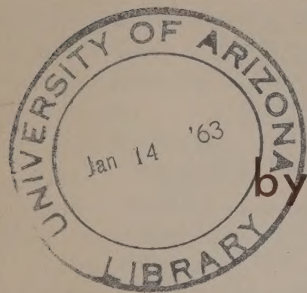


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FURNITURE RESTORATION



by Gena Thames

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FURNITURE RESTORATION

by Gena Thames

PART I

The “do it yourself” point of view so popular today plus the continued lure of antiques has increased interest in refinishing methods. The contemporary family’s way of life demands furniture, wall, and floor finishes that withstand maximum use and require minimum care. Recent developments in materials and methods have brought about finishes that resist moisture, alkalis, heat, acids, and alcohol, withstand injuries and abrasion, and are easy to care for. Such characteristics enable the family to achieve the greatest livability within the home.

Refinishing is a delightful hobby that many women as well as men enjoy. Real pleasure may be derived from finding beauty in the grain and color of wood hidden under layers of paint or varnish. Developing a mellow, satin-smooth finish can be a source of great satisfaction.

Furniture refinishing is not difficult for a beginner—that is, if the beginner is careful. Refinishing does require time and patience. You should not start a piece unless you are willing to put time, energy, and careful work into it. Each step must be undertaken carefully to avoid later difficulties which would require much time and effort to correct. There are

many ways to refinish furniture. Some techniques are best suited for professional use only. The methods included here are appropriate for beginners.

It is not necessary to practice on a piece of little value for fear of ruining a good piece. The first piece can be done as well as any later one.

Old furniture with beautiful color and grain usually has a natural finish—a clear finish which shows the natural wood color and grain with no apparent surface covering. Some pieces such as Windsors, Sheraton “fancy” chairs, as well as most of the Hitchcock type of chair and the Boston rockers, were made of wood that was intended to be covered with paint. These should be restored with paint. Some of them, however, have arms and rockers of cherry or applewood which should be given a natural finish.

Unfinished furniture of good simple design, durably constructed of wood that has natural beauty in grain and color, may be purchased at a reasonable cost and given a natural finish.

Maple arrow-back chair with old finish removed.
It has been refinished with a thin type of sealer.

OVER-RESTORATION

Over-restoration can ruin a fine piece of old furniture. Part of the charm of old furniture lies in the signs of age and usage that call to mind the people and social customs of other days. In refinishing old furniture, therefore, no attempt should be made to have the pieces look new. If the piece is not disfigured, leave some indications of age, such as traces of paint, the marks of the cabinetmaker, and signs of wear that come naturally with use through the years. The certainty that a piece is an antique, and its commercial value, often rest on these marks. Many old pieces of furniture need only to be cleaned, and this should be your first step if a finish is still on the wood.

If the original finish is smooth, not alligatored, no attempt should be made to remove it. If the original finish of valuable pieces is in good condition, it should not be removed, for the value would be largely destroyed.

Little Boston-type rocking chair, often called a "nursing rocker." This little rocker has been used for more than one hundred years. Originally finished in buttermilk paint, it is now stained with a blend of maple, walnut, and green water stain, and refinished with a thin type of natural penetrating floor sealer.



SOME PIECES MAY NEED CLEANING INSTEAD OF REFINISHING

Varnish, Lacquer, Oil, and Sealer Finishes

Furniture with a natural finish (except shellac) can be cleaned with the following solution:

- 1 quart hot water
- 1 tablespoon gum turpentine (to cut the dirt)
- 3 tablespoons boiled linseed oil or lemon oil
(to lubricate, feed, and polish the wood)

Keep this mixture hot in a double boiler while you use it.

Dip a soft cloth in the solution and wring it out. Do not use a dripping cloth. Apply the cleaning solution to only one part of the piece at a time. Rub the wood with the cloth, keeping moisture away from joints. Some surfaces may need friction to remove all the old dirt. No. 3/0 steel wool can

be used to rub the solution lightly on neglected pieces. Rub with the grain. Wipe the surface with another cloth wrung out in clear warm water. Wipe the surface immediately with a dry cloth.

After the surface has dried thoroughly, you may also want to use 3/0 steel wool and FFFF pumice powder with oil (lightweight mineral oil, paraffin oil, lemon oil, or olive oil) to lubricate the wood and smooth the surface. Dust the surface with FFFF pumice powder, and keep the steel-wool pad wet with the oil as you rub it over the surface, with the grain of the wood. Rub rungs with a mixture of pumice and oil, using the pads of your hands. On carvings, use an old toothbrush or nailbrush to remove dirt from deep crevices. Remove all traces of the oil and pumice or steel-wool particles with a soft brush and dry cloths until no finger marks show. Polish with a woolen cloth.

Shellac Finish

If you are in doubt whether the finish is shellac, you can tell by sponging a small area on the underside of the piece with denatured alcohol. If the finish is shellac, it will soften. A shellac finish should not be washed with water or alcohol. Water will turn it white, and alcohol softens it. A shellac finish should be restored. See page 9 for instructions.

Waxed Furniture

Remove dirt and wax with a cloth dampened with turpentine or a commercial wax remover and cleaner. The piece may then be rewaxed. If the wood is dark, the wax should be colored. See page 48.



Furniture Polish

The following is a good furniture polish:

Equal parts of: Lemon juice
Denatured alcohol
Olive oil
Gum turpentine

Dampen a lintless cloth, such as a clean woolen cloth, with this mixture. Apply to furniture, and wipe off with a dry cloth.

SOME FINISHED SURFACES MAY NEED REPAIR

White Spots or Rings

White spots on a varnish or shellac finish are usually caused by moisture, heat, or alcohol. You may repair them by using one of the following:

1. **FFFF powdered pumice and oil** (paraffin oil, lightweight mineral oil, olive oil, boiled linseed oil, or lemon oil): Sprinkle or dust powdered pumice lightly over the white spot or ring. Dip a No. 3/0 steel-wool pad into one of the above oils. Rub lightly with the grain of the wood until the spot disappears. Wipe the surface with a soft cloth.
2. **Powdered rottenstone and one of the above oils and 4/0 steel wool**: Rottenstone may be used instead of powdered pumice for surfaces with a more lustrous finish, such as lacquer.
3. **Salt and one of the above oils**: Put the salt and oil in separate dishes. Dip your finger in the oil,

then in the salt, and rub. Repeat as needed. If the white spot is old or very deep, much rubbing may be necessary.

4. **Damp cloth and household ammonia** (for deeper white spots): Wring out a soft cloth in clear water, then dip it in ammonia and wring it almost dry. Lightly and quickly, whisk the cloth over the white spot or ring. Rub the spot with a dry cloth.
5. **A commercial product** for removing white spots: Follow manufacturer's directions.

Paper Adhering to Surface

Warm oil—lightweight mineral, paraffin, olive, boiled linseed, or lemon—and No. 3/0 steel wool may be used to remove paper stuck to a surface. Saturate paper with warm oil; allow to stand a few minutes. Using the steel-wool pad, rub lightly with the grain of the wood. Apply more warm oil to the damaged area if necessary. Wipe the entire surface with a dry cloth.

Scratches

On unstained woods with a natural finish

Washing with the solution described on page 6 may make scratches appear less noticeable.

Broken pieces of nutmeats—pecan, English or black walnut, Brazil, or butternut—may be rubbed diagonally along the scratches until they become dark.

On stained woods with a natural finish

Choose a stain that will blend with the old finish, of a color like the type of finish originally used on the piece. On walnut finished with varnish, use a walnut varnish stain alone, or add it to a clear varnish of the same brand.

Varnish-finished piece

- A varnish stain may be bought ready mixed in wood colors. If too concentrated, varnish stain may be added to a clear varnish of the same brand.
- A colored varnish may be bought and added to a clear varnish of the same brand. Put container inside pan of hot water before applying.
- A varnish may be tinted with colors-in-Japan (finely ground pigment in a base of quick drying varnish instead of linseed oil). Use gum turpentine to thin colors-in-Japan.
- Gum turpentine applied with a small brush will soften the varnish over a very small scratch. Colors in oil, such as burnt umber, thinned with gum turpentine, may be applied diagonally to a scratch with a small brush or with your finger.
- A commercial scratch remover may be used.

Lacquer-finished piece

- Use a lacquer thinner to soften the lacquer finish. Apply with a small brush or toothpick.

Shellac-finished piece

- Soften the shellac around the scratch by brushing it with denatured alcohol.

To apply stain or solvent to scratch

Apply the stain or solvent diagonally along the scratch with your bare finger or with a small pointed brush, feathering it out toward the edges. When it is dry, rub the surface with a lintless cloth. It may be necessary to repeat the entire process after 24 hours.

When dry, rub varnish or shellac surfaces with pumice and oil, page 40, lacquer surfaces with rottenstone and oil. Apply furniture polish or wax if desired.

Cigarette Burns

Rub charred surface with 3/0 steel wool, being careful not to scratch the surrounding area. Wrap steel wool around the end of an orange stick or a pencil with the point removed. If the burned place is not deep, after all the charred parts have been removed, color and fill the spot with color in oil added to sealer or varnish, or use a colored sealer or varnish stain. Several coats of this may be needed. If the depression is deep, fill it with stick shellac. See page 36.

Small Holes or Gouges

Small holes or gouges may be filled without removing the finish. Remove the dark edges from old holes with an orange stick wrapped with steel wool or emery cloth. In some instances the hole may be drilled larger to remove darkness around the edges. Fill with:

Stick shellac (see page 36)
or

Spackling compound and stick shellac (page 36)
or

Wood-forming plastic and stick shellac (page 36)

Small Cracks

Small cracks may be filled with a wood-forming plastic that has been colored with colors in oil. Dissolve color in oil in a very small amount of gum turpentine. Thin the plastic filler with denatured alcohol, if necessary. See page 16.

SOME FINISHES MAY NEED RESTORING

Hairline Checking in Varnish

Hairline checking is often caused by exposure to sunlight or heat and by sudden or repeated changes in temperature. It may also be caused by too much or too little moisture in the wood before the finish was put on, or the way the veneer was cut and which side was used for the outside surface.

To slow up this tendency to check, wash the finish with hot water, boiled linseed oil, and gum turpentine (see page 6). When the piece is thoroughly dry, rub the surface with a mixture of:

- 2 tablespoons boiled linseed oil
- 1 tablespoon gum turpentine
- 1½ tablespoons varnish

Warm the mixture in a container placed inside a pan of hot water or in a double boiler. Apply the warm mixture with a 3/0 steel-wool pad, rubbing with the grain. Apply to only a small area at a time. When the mixture begins to stiffen on the surface, rub off with dry lintless cloths. **Caution: Remove all excess to prevent surface stickiness.**

Milky, Cloudy Appearance on Varnish

A cloudy appearance on varnish may be caused by smoke, dust, and grease collecting on the surface.

Wash the piece with hot water, boiled linseed oil, and turpentine, as directed on page 6.

Mix equal parts of *raw* linseed oil and gum turpentine. Apply with a 3/0 steel-wool pad, rubbing with the grain. Wipe off with a dry cloth.

A poor-quality varnish may also cause this cloudiness. Usually this dullness cannot be removed.

Old, Worn Shellac Finish

First, remove any old wax from surface with a cloth dampened in gum turpentine. Mix 2 parts paraffin oil in 1 part white shellac. Apply with 3/0 steel-wool pad, rubbing with the grain. Wipe with a lintless cloth. **Caution: Shellac must be fresh. Old shellac remains sticky and will not dry.**

When a finish is "alligatored" like this, it is past restoring and should be removed.



PART II

REMOVE THE OLD FINISH

Dislodging layers of old paint or varnish is not difficult, but does require patience, time, and perseverance to get the surface clean.

Removers

A good grade of commercial paint and varnish remover is the safest material to use in preparing wood for a natural finish. Some removers work more quickly than others. The kind and age of finish and number of layers affect this.

Commercial removers are available in a thin water-like consistency and in semi-paste and paste types. Beginners will find the thicker removers easier to use since they tend to stick to the surface and remain in place without running off. Some contain wax. These should be counteracted with both

denatured alcohol and gum turpentine. Read directions on the label.

There are non-inflammable as well as inflammable types of remover. The non-inflammable type is preferable.

Never Use Lye

A beginner should not use lye to remove a finish. Lye burns and pulps wood. Because of difficulty in removing and counteracting (stopping) the action of lye, the new finish often remains sticky and does not dry. It may even come off in a short time.

Scraping Destroys Original Surface

Scraping a surface with sharp tools or glass, planing, or even cutting too deep with abrasives will destroy the original surface. The mellowness and texture in old wood (called pa-



Hold can with opening at top so that air may enter and enable liquid to flow evenly.

Varnish remover
(preferably a non-inflammable paste type)
Denatured alcohol
Gum turpentine, if remover contains wax
Putty knife
Wide wall spatula for large surfaces
Old paintbrush or cheap brush
(cut off ½ inch before using)
Old toothbrush

EQUIPMENT

Orange or lollipop sticks or wooden meat skewer
Threads raveled from burlap, or soft twine
Steel wool, 2/0 and 3/0
Clean old cloths
Newspapers
Covered containers to hold remover and alcohol
Covered metal container for used rags and papers
Covered can for discarded liquids
Waterless hand cleaner (to protect your hands)

tina) is brought about by age, years of use, and repeated rubbing. Once removed, it cannot be replaced. There is also danger of gouging the surface when a beginner uses a scraper.

Remove Hardware

Before starting to remove the finish, take off hinges from table leaves; remove handles and knobs or other hardware from doors and drawers to make finishing of parts easier. Old cane, padding, and upholstery should be removed from chairs.

Remove Old Paint and Varnish

Place the piece in a horizontal position to keep remover from dripping and running down. Apply varnish remover to an entire small section at a time—a leg or rung or dining-table leaf. Use newspapers to protect parts not being worked on.

Immediately wipe off any remover that drips on parts. It will spot if it is left on. It is very difficult to remove marks left by the remover, even with an abrasive.

If remover contains wax, apply it with brush strokes, always brushing in the same direction—not back and forth. This type forms a waxlike film over the surface to keep the liquid in the remover from drying out.



Apply a heavy coat of good commercial paste-type varnish-and-paint remover. Allow it to "pimple" thoroughly.



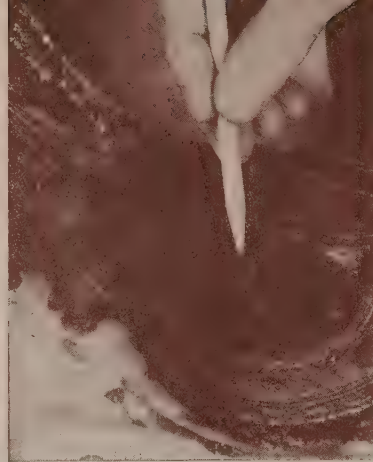
SPACE TO WORK

Arrange to have a place to work that is well ventilated and has ample light. Good ventilation is necessary to prevent possible toxic effects from fumes of the remover, alcohol, turpentine, etc. There is a danger of fire when an inflammable paint and varnish remover is used in a room with no open windows.

A thick layer of papers should be placed on the working area and the floor to protect them.

On a wide surface, lift off carefully with the grain, using a dull putty knife or wide wall spatula.





Loosen and remove old finish from grooves and carvings with a discarded toothbrush dipped in remover. An orange stick or wooden meat skewer will help to loosen and remove the old finish.

While the third coat is still wet, scrub this wet remover into the wood with steel wool, size 2/0 or 3/0. Wipe off with newspaper or old cloth and repeat again immediately if necessary.



Apply a second coat of remover generously. After the second coat has pimples as much as it will, apply a third coat of remover on top of the second coat.



Wipe remover and old finish from legs, rungs, etc., with pieces of clean newspaper or clean coarse rags. A string raveled from burlap and wrapped with steel wool may be dipped in remover and used to soften and remove old finish.

Continue to apply remover until there are no indications of old finish. Stickiness, shiny spots, and places from which a light powder may be scraped indicate traces of the old finish.

Thoroughly clean off all the remover with denatured alcohol. **Do not let remover dry and remain on the piece.**



Scrub the surface with a clean piece of 2/0 or 3/0 steel wool dipped in denatured alcohol. Wipe off with a coarse cloth, such as burlap, dipped in clean alcohol. Repeat with clean steel wool and alcohol if necessary.

Wash the piece with denatured alcohol until there is no white, smoky appearance. Some removers do not require a counteractant such as denatured alcohol. Directions of the manufacturer of the remover should be followed carefully in this instance. However, if you are in doubt and the surface feels slimy, use denatured alcohol.

All remover must be cleaned off or the new finish will be sticky and will not dry.



To clean grooves, turnings, and carvings, scrub with a wire suede brush and denatured alcohol.

Clean around joints and carvings with an orange stick or wooden meat skewer.

Rub remover from turnings with an old toothbrush or a burlap string and steel wool dipped in denatured alcohol.



Remove Refractory Paint and Stain

On many old pieces, usually those made of pine, the wood has been covered with penetrating red paint which was made by mixing red pigment (iron oxide) with skim milk or buttermilk. In the old days, this paint was considered desirable because it thoroughly covered all knots and imperfections and gave an effect somewhat like that of the richer

woods of mahogany and cherry. Other pigments used were lamp black (soot from kerosene lamps) for black, brown sienna (earth color), and green.

It is difficult to remove a buttermilk or skim milk undercoating of paint from wood, as it is a refractory paint that penetrates deeply into the pores of the wood. The method below has been found successful for removing refractory paint as well as other types of paint and varnish.

Procedure

- Keep refractory paint wet with remover while dislodging coats of old finish. See pages 11-13.
- After removing the old finish, moisten the surface with denatured alcohol and rub with 2/0 or 3/0 steel wool with the grain. Keep the surface damp with the alcohol while rubbing. Repeat.
- You will probably have traces of paint left on the piece. These are signs of age and might be left. Most pieces with refractory paint were made of wood that was intended for painting and not for a natural finish.
- Sal soda (washing soda) may be tried next while the surface is still wet. It is suggested that this be done out of doors or on a cement floor. Stand away from the fumes when mixing it. Dissolve one pound of sal soda in five quarts of hot water. Apply solution with a mop. Let stand about 10 to 20 minutes and scrub with a brush. Rinse thoroughly with cold water, wipe off, and place the piece out of the sun and drafts to dry.

Caution: Sal soda should not be used on mahogany, cherry, rosewood, or veneered surfaces. Water will cause the glue to soften on veneer.

MAKE NECESSARY REPAIRS

Remove Dents and Bruises (do not attempt on veneer)

Remove dents and bruises by placing several layers of damp woolen cloth (such as a blanket) over the entire surface and pressing with a hot iron. Concentrate on the dented area. The warm moisture causes the wood to swell and rise to its normal height. This operation may have to be repeated.

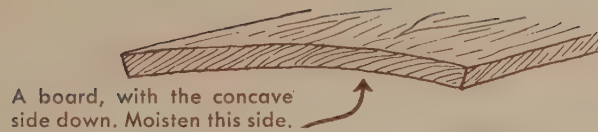
Removing dents sometimes stains the surface; therefore this process should be done before you attempt to remove any dark stains.



Remove Warp

The warping of a table top and leaves may be largely prevented by finishing both sides of the wood. An unfinished side is easily affected by hot air which dries out the moisture in the wood, and by moist air which swells the wood fibers.

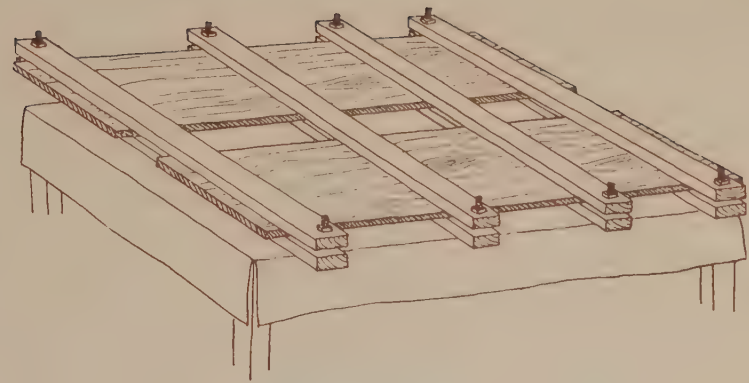
In refinishing a warped table, you can remove and straighten the leaves and top if clamps are available, or you can take them to a cabinetmaker who has the right equipment.



First, moisten and swell the pores of the wood on the concave side in which the moisture has dried out. Moisture may be added in several ways: the boards may be steamed over a kettle; or they may be thoroughly dampened in a tub and placed on a flat surface in the direct rays of the sun with the concave side down. To keep them wet till they are straight, cover them with a 2-inch layer of wet sawdust or wet newspapers. In using sawdust (or papers) several boards may be straightened at the same time by piling them one on top of another with sawdust between them and over the top. Place weights, such as bricks, on top and keep the sawdust wet. The straightening may take several days, and longer in cold weather. Keep boards damp until they have straightened.

When the boards are straight, you will have to keep them that way until they are dry. You can add a weight, such as a brick, or flat rock each day until the boards are dry. Or you can use clamps to keep them in a flat position until they are dry.

Homemade clamps for large boards may be made by using pairs of two by fours with holes bored for $\frac{1}{2}$ -inch bolts. Each bolt should be fitted with a nut and two washers. Use enough clamps so that their centers are no more than 12 inches apart. Loosen the clamps a little two or three times a day to allow the wood to shrink evenly; otherwise the wood may split. If more than one board is placed in the clamps at the same time, leave air spaces for drying by placing a narrow strip of wood between the boards at each clamp.



Replace Veneer

To replace veneer, remove old glue from the base and the underside of the piece of veneer with hot vinegar. Allow both parts to dry thoroughly before gluing.

See that

- The color and pattern of grain blend with that in the area around the patch
- The piece is cut and placed to match the direction of the grain of the veneer by the mended area
- The piece is trimmed and cut to fit the patch exactly

Gluing (for types of glue, see page 18): Apply glue to the base only and not to the piece of veneer. Put the piece in place; press down firmly. With a lintless cloth dampened with warm water, remove any glue that oozes out around the edges.

A small thin board of soft wood should be placed over the glued piece. Clamp in two places. The thin board insures an even pressure and protects the surface from being damaged by the clamps. See page 19.

If clamps are not available, a number of heavy books or bricks can be placed over the board.

Repair Blisters

Using a sharp knife, slit the blister with the grain of the veneer near a side of the veneer still adhering to the base. Pour hot vinegar into the blister and allow it to remain about eight hours. Carefully lift up one side of the blister with a knife; remove the excess moisture and old glue with a thin layer of cloth dampened in hot vinegar. Add more hot vinegar if necessary. Sponge out.

Allow area to dry thoroughly, possibly 24 hours. The veneer and the base must be thoroughly dry before gluing.

Insert glue carefully through the slit **on the base only**, using the point of a knife or a toothpick. Press down firmly. Wipe off excess glue on the surface with a cloth dampened in warm water. Wipe off surface with a dry lintless cloth.

Place a small thin board over repaired area. Clamp as above.

Repair Small Cracks

Small cracks in surfaces near an edge may be repaired in two ways: over an old finish or after several coats of new finish have been applied and are thoroughly dry. Both permit a better blending of colors in the filler with that in the surface, since finish coats bring out the natural color of wood. This also makes it easier to fill the crack since the filler does not cleave to the finished surface around the area of the crack as it does on unfinished wood. Apply coats of finish to entire surface when crack filler is dry.

Fill cracks

A wood-forming plastic colored with colors in oil and thinned with denatured alcohol makes an excellent crack filler. Mix the colors in oil with a very small amount of gum turpentine before adding to the wood-forming plastic.

For colors, see page 30. Remember the color of the wood-forming plastic is much lighter when dry. Add denatured alcohol to the colored wood-forming plastic till it is soft.

Use your finger to place it diagonally in the crack. Slide a knife blade across the crack to smooth the filler. Repeat if necessary.



Unless finish is shellac, use a cloth dampened in denatured alcohol to remove filler that remains on outer edge of crack. When it dries, smooth it with 3/0 steel wool. This process may have to be repeated if the filler shrinks below the level of the surface.

Glue cracks

To glue a crack, very carefully force crack open by placing several small wedges of a soft wood down into the crack. Insert the glue with a toothpick or small brush. Remove wedges and clamp. Hold in place for 24 hours. Cracks may be glued either before or after you apply a finish. For types of glue, see page 18.

REGLUE PIECE IF NECESSARY

Varnish and paint removers loosen glued joints; therefore regluing should be done after the old finish is removed.

EQUIPMENT

Select from the following list what you need for your gluing job:

TO MARK PARTS

Pencil (colored, if piece is varnished), or
Masking or adhesive tape (about one-half inch wide)
to mark joints
Scissors

TO LOOSEN JOINTS AND REMOVE GLUE

Claw hammer; hard-rubber tip to put over the hammer
end. The kinds used on the end of canes or crutches
are good. A piece of leather or a paper pad over
a wooden mallet may be used instead
Hot vinegar
Knife to scrape off old glue and to slash smooth joints
Several small pieces of thin soft wood (could be ply-
wood) to use with hammer in taking chair apart and
to use with sandbags

TO REPAIR

Coping saw or other small saw
Dowel sticks ($\frac{1}{4}$ inch to $\frac{5}{8}$ inch) to replace missing or
broken rungs, or to use as dowel pins
Dowel pins, spiral or grooved, from $\frac{3}{8}$ inch to $\frac{5}{8}$ inch, to
mend dowel joints
Brace and bits to correspond with sizes of dowels and
dowel pins
Screw drivers, one small, one large
Portable vise, if possible
Pliers
Countersink and nail set

Finishing nails, $\frac{1}{2}$ inch to $1\frac{1}{4}$ inch

Flat-headed screws (sizes 4-10), slender, $\frac{3}{4}$ inch to 2
inches long

Bar of soap to soap screws; this makes screwing into
hardwood easier

TO ASSEMBLE PARTS AND REGLUE

Abrasive finishing paper, 2/0 or 3/0

Thin pieces of cloth to cut into strips to use in joints

Shears to cut paper and cloth

Rags to wipe off the glue

Small stick of soft wood to make wedges (from cigar
box or kindling)

Sandbags, about 5 inches by 8 inches, three-quarters
full of dry sand

Paper for padding

Several clamps of different sizes and types to hold glued
parts together

"C" clamps—open 3 inches to 8 inches

Cabinetmaker's clamps—open 3 feet to 4 feet

Rope to hold large joints together

Clothesline is good. You will need at least 50 feet of
about size 7 line

Cord to hold small joints together

Heavy fish line or sash cord is good

Newspapers for pads to use under rope

Nails, 40d (penny) or round sticks, 5 inches long, to
use with rope or cord to make tourniquets

Types of Glue

Plastic resin glue

Plastic resin glue comes in powder form to be mixed with water, is strong, waterproof, easy to apply, and does not stain or dry out readily. Use in 4 hours after mixing. A “white” ready-mixed glue is also available in tubes, and pint, quart, and gallon containers. This new type sets very quickly at 50° F. and above, which is a lower temperature than older types require. It is both colorless and odorless.

Animal glue

Animal glue or “hide” glue is strong but needs skill in handling because it hardens in about a minute. Made from the hides of slaughtered animals, it comes in flake, ground, or liquid form. It flows easily and penetrates the pores of the wood. It does not stain the wood but it is not waterproof and “skins over” very quickly.

Small amounts are prepared as needed. The glue is broken up and allowed to soak in cold water for about 12 hours. Then it is simmered in a double boiler to about 140° F. until it becomes liquid. Boiling reduces its strength. Use while hot. It can be reheated and used again.

The ready-to-use liquid glue should be allowed to get tacky on surfaces before joining. It is slow-drying, is attacked by moisture, and does not hold as well as the flake or ground glue. It can be used on small pieces, however.

Casein glue

Casein glue is strong and hardens in about fifteen minutes. It penetrates the pores but is not waterproof, and discolors some woods. It is a milk product that comes in powdered form and is sold under various trade names.

A small quantity is mixed as needed by adding an equal

amount of cold water to the powder (or follow the directions on the package). Use it cold, within 8 hours.

A Good Gluing Job

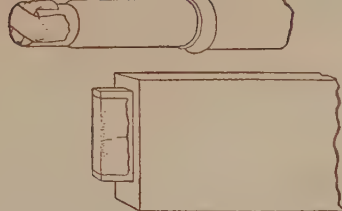
The parts to be glued hold together only when they are completely free from the old glue, paint, and other surface covering; when the wood is dry and the pores are open; when the parts to be glued are close-fitting, with all surfaces touching each other; and when they are held together tightly until dry (about 24 hours after applying the glue).

Steps in Regluing

Preparation

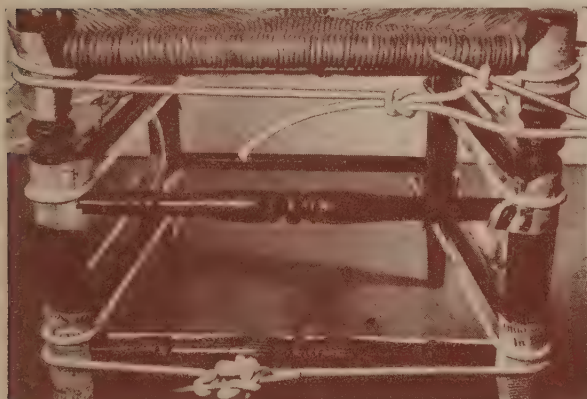
- Mark the parts at each joint with colored pencil or tape. Mark position with a number and mark joints with the same corresponding number.
- Use a wooden mallet or a hammer with a rubber tip over the head, to gently knock parts loose. Let firm joints remain as they are if possible. Joints may be repaired without taking the whole piece apart if the loose sections are spread far enough apart to insert glue. Otherwise it may be necessary to pull out the legs, rungs, or other sections and reassemble them. If this cannot be done with the hands, hit joints sharply with a wooden mallet, first protecting the finish with a soft piece of wood or with a pad of paper.
- Remove all old glue with hot vinegar. Scrape or chip off the old glue from parts. If surface around joints is smooth, slash lightly with a knife. **Caution:** Wood must dry 24 hours before it is reglued.
- Assemble parts; be sure they are warm and dry; try joints to see if padding is needed. If the joints fit loosely, insert one or two strips of thin cloth to fill the extra space, or glue a piece of dowel into

Use cloth strips to pad
loose joints



the hole and drill a new hole for the part to be inserted. Cut the cloth strips narrower than the dowel and, because they stretch when wet, cut them to extend only half the depth of the dowel.

- To open the pores to absorb the glue, warm the wood near a radiator or in the sun. Never glue cold wood.



Tie joints together



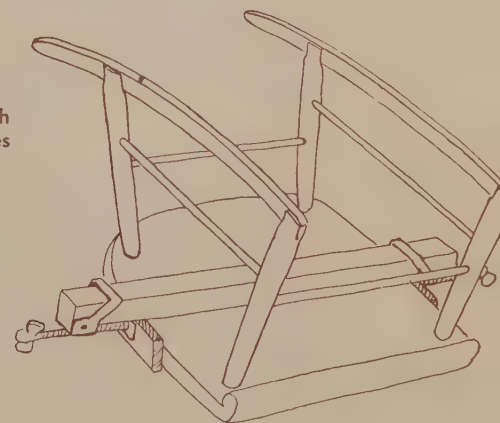
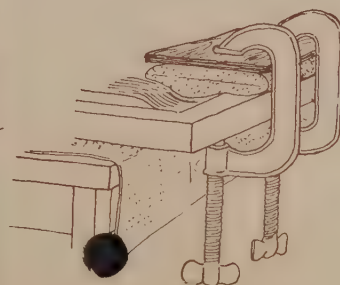
Procedure

- Assemble materials and equipment needed in order to glue as rapidly as possible. Glue sets quickly
- Arrange parts of pieces of furniture as they are to be assembled with numbers matching
- Mix plastic resin glue with a very small amount of water, if you are not using ready-mixed glue
- Place glue on parts with a brush. Use two coats of glue on end grain since it is absorbent. Add padding if needed
- Fit parts together
- Wipe off glue that oozes from joints or cracks immediately with a cloth dampened in warm water
- Clamp or tie joints or breaks

Allow reglued piece to remain in clamps or tied for at least 24 hours.

Clamp joints or breaks with
gluing clamps—(sometimes
called cabinetmaker's
clamps)

C clamps—for light use



PART III

PREPARE NEW WOOD FOR FINISH

Dampen

Furniture that is purchased unfinished should be wiped with a cloth dampened in glue size:

4 tablespoons liquid glue to 1 quart warm water

Let the Surface Dry Thoroughly

This dampness is absorbed by the short hair whiskers or hair grain causing them to stand up. This is called raising the grain. It takes the wood several hours to dry.

When Dry, Smooth

Smooth with 2/0 to 6/0 garnet finishing paper or 1/0 to 6/0 aluminum oxide finishing paper, until satiny. Dust.

Rub with Steel Wool

Better results are obtained if the surface is rubbed down with a 3/0 steel-wool pad after smoothing with an abrasive finishing paper (see page 26). This helps to remove all of the hair grain, smooths the surface for a uniform penetration of stain and finish, and prevents "cloudiness" in the finish. See page 33 for finishing.

PREPARE OLD WOOD FOR FINISH

Remove Stains or Freshen Color

Remove dark spots by bleaching them with a solution of oxalic and tartaric acid. Apply to the entire surface with a brush or cloth and allow it to remain on about 20 minutes. For a more even effect, it is advisable to use the acid over the entire top of the surface and not over the spot alone. Immediately wash off the acid with a weak ammonia solution followed by clear water, and let the surface dry for 24 hours.

When the wood has a gray, faded appearance, wash the entire piece with this oxalic and tartaric acid solution to freshen the color. It is advisable to wear a mask when smoothing after this process.

If bad spots cannot be removed by bleaching, it may be necessary to sand or scrape the wood slightly. It is better to let an experienced person do this, with a warning against removing any more surface than is necessary. Not all finishers and cabinetmakers appreciate and respect the beauty of a wood surface that comes only through age. Too much sanding, planing, or scraping injures the mellowness and richness of color and texture of the surface achieved from age and usage. This mellowness is known as "patina." Moreover, the new wood beneath will not be the same color as the rest of the piece that has not been scraped.

EQUIPMENT

2 ounces oxalic acid
2 ounces tartaric acid } Available in drugstores

Dissolve these in one quart of hot water in glass or enamel container.
Bottle and label POISON.

Household ammonia, non-sudsing (available in grocery stores)

Add one tablespoon of household ammonia to one quart of cold water;
bottle and label.

Newspapers; cloths

3 glass bowls (about pint size)

Steel wool, 3/0 or 000



Remove Grease

Frequently oil and grease have penetrated into the wood in an old dining table, wooden salad bowl, and cheese or meat boards. Remove as much of this grease as possible, so that a finish will adhere to the surface. Scrub the surface with carbon tetrachloride, benzine, or a similar product. Scrub with a brush and then with 3/0 steel wool. Allow to dry thoroughly. Repeat two or three times, allowing drying time between, possibly one day.

Smooth Surface with Abrasives

- Always make strokes straight with the grain of the wood—never around or across the grain
- Protect parts where grain goes in another direction

- Maintain an even pressure. Use a smoothing block on large surfaces
- For first smoothing, choose an abrasive finishing paper of a **coarseness** that will not scratch (this varies with the kind of wood)
- For last smoothing, choose an abrasive of a **fineness** that will produce a satin smoothness when rubbed. It should also bring out the grain. Brush sandings out of abrasive paper to make it last longer and cut more efficiently
- When final smoothing is done, brush sandings out of carvings, crevices, and turnings. Wipe entire surface carefully with a dry cloth, and wipe with a tack rag (see page 27)

TYPES OF ABRASIVES

ABRASIVE FINISHING PAPERS

Finishing papers have a finer grit than cabinet papers and are recommended to smooth furniture surfaces for finishing.

Aluminum oxide paper, a purple-brown color: Is considered a more all-around finishing paper, cuts faster, lasts longer, and is tougher than other abrasives. It is next in hardness to silicon carbide finishing paper. Aluminum oxide paper has been released to the retail trade only recently, and is available under different trade names. It is especially good for smoothing hard woods.

Use—Fine 1/0–3/0 For first smoothing
Very Fine 6/0 For final bare wood smoothing
(dry or wet) For smoothing between finish coats

Garnet paper, a tawny red color: Will smooth a surface of soft wood as efficiently as aluminum oxide but requires more time and effort on hard woods.

Use—Fine 2/0 For first smoothing
Very fine 6/0, 7/0 For final bare wood smoothing
(dry or wet [waterproof]) For smoothing between finish coats

Silicon carbide paper, varies in color from a shiny steel gray to black.

Use—Grit 240A–280A (dry) For removing hair grain on fibrous woods—gum wood, white wood, and some mahogany. Smoothing should be done **just before** staining or applying finish. If the piece is left to stand 10–12 hours after smoothing, moisture in air will raise fibers again.

Grit 360A, 400A, 500A For smoothing between finish coats. Use wet with mild, soapy water. After smoothing, wipe off with a cloth dampened in clear water. Dry.

OTHER ABRASIVES

Abrasive screen, the most recent abrasive material available: Is made of a screen-like open mesh material coated with silicon carbide. Both sides are equally abrasive. The open mesh allows sandings to pass through, preventing “clogging.” The abrasive screen is used primarily on metal

but is also used between finishing coats and in smoothing bare hard woods. Use work gloves and a sanding block.

It comes in grits 600 through 180 and may be used dry or wet.

Steel wool, made of fine wool-like strands of shredded steel: Is a very good all-around abrasive for final smoothing. It is recommended for use in final smoothing of all bare wood surfaces, after smoothing with an abrasive paper. (Veneers should be smoothed with steel wool only.) It aids in removing all of the hair grain and smooths a surface for uniform penetration of stain and finish. It imparts a satin-like smoothness and brings out the grain before the finish is applied. Steel wool is safe to use on curves, turnings, and edges. You will find that pad-form steel wool is easier to use. It is available in one-pound packages of 16 pads. **Caution:** Manufacturers vary in methods of numbering.

Super-fine 000–3/0 For final smoothing of bare wood surfaces after using abrasive paper and before applying finish, especially on curves, turnings, carvings, and concave surfaces as well as straight ones

Between finish coats to remove bubbles and to “make tooth” for the next finish coat and to smooth the dry finish coat

No 4/0, the finest May also be used but becomes imbedded in the fingers and is difficult to remove. Gloves should be worn to protect hands even when using 3/0 steel wool

Emery cloth: Is used principally to polish turnings and reeded legs. It may be used on curves but steel wool will achieve the same smoothness with less damage. Emery cloth will remove rust and corrosion from metal surfaces.

Use—Medium 1/0 For first smoothing of reeded legs and turnings if rough and pulpy

Fine 2/0 To smooth reeded legs and turnings

Crocus cloth: Size 0111 may be used on dark woods for final smoothing where extreme smoothness is desired. It appears to bring out the natural oil in the wood and produces a satinlike polished smoothness. **Caution:** It gives a reddish tint to blond woods.

EQUIPMENT

Masking tape to protect parts of furniture

Smoothing block—a piece of soft wood about 1 to 1½ by 3 by 4½ inches; thin rubber pad or felt attached to base; or a commercial smoothing block

Fine wire suede brush to clean abrasive papers

Three-cornered file: extra slim taper

Steel wool: 3/0 or 000

Old cloths

Abrasive paper

FOR FIRST SMOOTHING

Finishing paper—1/0 to 3/0 aluminum oxide or 2/0 garnet

Abrasive cloth—1/0 emery cloth for reeded legs and turnings if rough and pulpy

FOR FINAL SMOOTHING

Finishing paper—240A–280A silicon carbide (dry) for removing hair grain on fibrous woods

Finishing paper—6/0 aluminum oxide or 6/0 to 7/0 garnet

Abrasive cloth—2/0 emery cloth for reeded legs and turnings, or crocus cloth size 0111 for dark woods

Steel wool—3/0

BETWEEN FINISH COATS

Steel wool—3/0

or

Finishing paper—6/0-7/0 garnet or 360A, 400A, or 500A silicon carbide dipped in mild soapy warm water

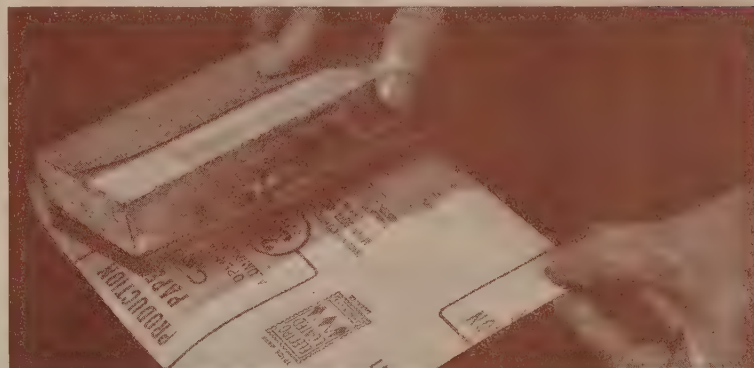
FOR REMOVING DUST

Dry lintless cloth

Tack rag

Procedure

Use a block with 2/0 to 6/0 garnet or aluminum oxide finishing paper wrapped around it.



A block of soft wood with a felt pad or piece of rubber, such as is used for kneeling pads or rug pads, glued to the base. The size of the block may be 1 to 1½ inches thick, 3 inches wide, and 4½ inches long. A blackboard eraser may be used instead.

A block of soft wood without a felt pad or layer of rubber if used in smoothing pine or fir wood will remove hair grain more efficiently.



Smooth with the grain to keep from scratching the wood.



Brush particles of sanding dust out of grit of abrasive paper.

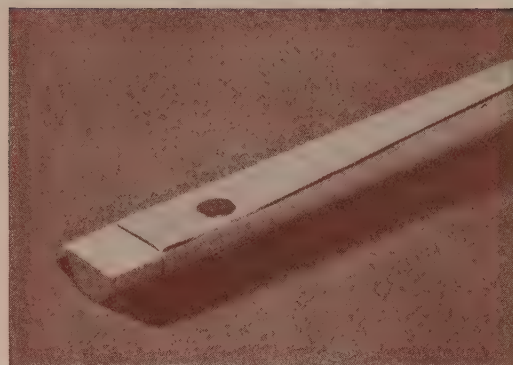


Protect sections where grain goes in another direction with masking or adhesive tape. Protect veneered surfaces with tape where remainder of area is to be smoothed with an abrasive paper.

Veneered surfaces should be smoothed with steel wool instead of with an abrasive paper that cuts deep. Often these surface cuts do not show up until a coat of finish is applied.

Smooth grooves, reeded parts, turnings, and crevices with a one-inch strip of 2/0 emery cloth folded down the center.





To smooth a long curved surface, use a half-round wrapped with abrasive paper.

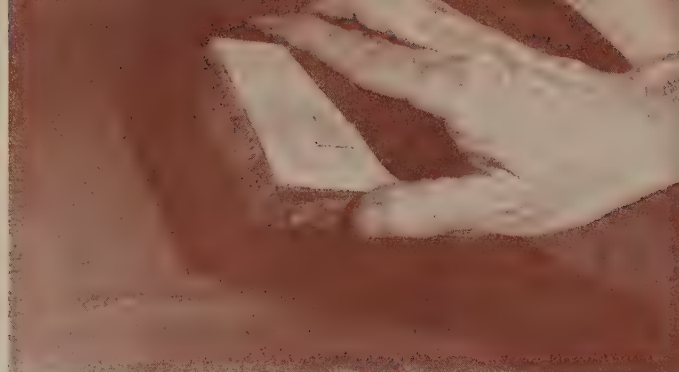


To smooth a concave surface, such as a salad bowl, wrap abrasive paper around a smooth ball like a baseball. A golf ball may be used for smaller salad bowls. Smooth with the grain. Rub surface with 3/0 steel wool. Wipe off with tack rag before applying finish.



An extra-slim, tapered, three-cornered file or edge of a half round rasp or a corner of a regular file may be used carefully to smooth turnings, reeded legs, and to remove dark discolorations.



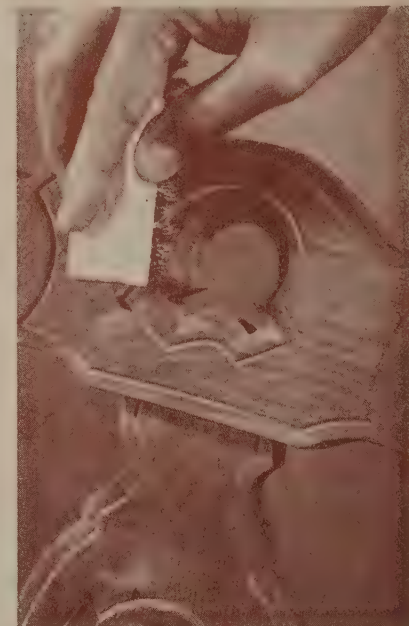


Better results are obtained if the surface is rubbed down with a fine steel-wool pad, 3/0, after smoothing with abrasive paper. This helps to remove all the hair grain and further smooths the surface for uniform penetration of stain and finish.



To smooth a curved veneered surface such as an ogee frame, wrap 3/0 steel wool around a half-round.

Brush steel wool fragments out of corners, carvings, and crevices. Brush sandings out of grooves and crevices.



EXAMINE PIECE TO SEE IF IT

- Has a white, smoky appearance (if so, remover has been left on)
- Is sticky (indicates old finish being left on)
- Is free from old finish and old glue in crevices and joints
- Needs gluing
- Has a smooth surface (wood whiskers left on result in a cloudy finish)

Wipe Surface with a Tack Rag

Before each application, wipe off surface with a dry cloth. Then wipe off surface with a tack rag. A tack rag is a treated wiping cloth that picks up fine dust and particles that an ordinary cloth will not remove. Tack rags may be obtained at automobile supply shops and some paint stores for little cost. Store folded cloth in aluminum foil or in a very small jar with a tight lid.

To make your own tack rag

Wash a piece of closely woven cheesecloth several times. Then dip it in warm water, wring it out slightly to prevent drip, wet the cloth with turpentine, and shake it out loosely. Dribble varnish freely over the surface of the cloth. Use enough varnish to make the cloth quite yellow. Then fold and twist it into a tight roll to force out the water and to allow the varnish and turpentine to saturate the cloth. Twist a second time. The tack rag should be sticky enough to pick up dust but dry enough not to leave moisture on the furniture. If it should dry out in using, sprinkle a few drops of turpentine and water over it. If it is too moist, shake it out in the air for a few minutes. Rough edges should always be folded inside as the cloth is used. Store as directed above.

Stain Wood if Necessary

A stain is needed on:

- Wood, such as basswood, gum, and poplar, that has no natural beauty
- Wood that appears faded or grayed
- Piece that has several colors or types of wood in it
- Wood that has been previously stained

TO PREPARE THE SURFACE

3/0 steel wool

Dry cloths and tack rag

TO STAIN

Stain and stirring sticks

Brush or lintless cloths to apply it

Plenty of clean, dry, lintless cloths to remove excess stain

Discarded nylon hose for straining, if necessary

For oil stain—boiled linseed oil and gum turpentine; containers to mix

For hands—greaseless hand cleaner and paper towels

A stain is not usually needed on woods that have natural beauty in pattern and color, such as mahogany, walnut, cherry, pine, and maple. A clear natural finish will darken the wood slightly, add warmth, and bring out the beauty in color and grain.

If a stain is desired, it should be used after the surface is smoothed and before a coat of finish is applied. Surfaces must have a satin-smoothness before staining; otherwise, wood whiskers left on absorb more stain than the flat surface and cause a coarse, cloudy appearance. Staining should be done in the daytime when the light is good. Colors do not appear true in artificial light.

Water Stains

Water stains come in powdered form in wood colors ready to be mixed with water. They are good for modern hardwood furniture that does not take an oil stain well. They are not ordinarily used on veneer. May be used on:

Birch

Cherry

Mahogany

Maple

Walnut

Rosewood

Advantages

- Powdered pigments are mixed with water and keep indefinitely
- Colors can be diluted with water to any strength desired; colors may be mixed for tone desired
- Colors are clear and rich with good tone depth and do not fade when exposed to sunlight
- Colors do not bleed, therefore no binder is needed. They seem to be a good solution for modern inexpensive furniture that requires staining, especially that requiring a mahogany stain (penetrating mahogany oil stain bleeds)
- Are inexpensive

Disadvantages

- Water stains are not generally available and often need to be ordered
- Not all water stains on the market are natural wood colors
- They wet the wood and should not ordinarily be used on veneered surfaces
- They tend to raise the grain more than other stains, but this has been greatly overemphasized

To mix water stains

Use a glass or enameled vessel (never aluminum or other metal). If the water is hard, use distilled water. Otherwise, boil water, cool, and strain.

Add water to stain (in powder form). Stir. Pour into glass containers and label the color. Add more water for lighter colors. Mix two or three colors to get blends.

To apply water stains

Smooth and stain a test area on the underside of the furniture to be sure the color is appropriate for the wood. If the piece contains a light and a dark area to be stained, lighten the stain by adding water to use on the dark area. Keep in mind that tones will vary with the different growths and cuts of wood; also with hardness and softness.

Wipe piece of furniture, especially turnings and end grain on very soft wood, with a damp cloth just before using the water stain. This insures even penetration and prevents streaks and a darker shade than desired.

Apply water stain with a 2-inch brush or a lintless cloth; wipe off excess with another cloth. Allow to dry slowly and thoroughly, away from heat so that wood will not warp and crack. It should dry at least 24 hours.

Smooth lightly with fine abrasive paper; then rub lightly with 3/0 steel wool. Care should be used in smoothing edges since it is very easy to remove the color at this stage.

Tobacco Stain — "Old Pine Finish Look" — on new pine paneling and furniture

Break up one plug of chewing tobacco in a jar; add one pint of household ammonia, preferably not the suds type. Place lid on jar and let stand for about one week. **Wipe surface, turnings, and end grain with a damp cloth just before applying stain, to insure even penetration and to prevent streaks and a darker shade than is desired.** Strain liquid through clean nylon hose and mop or "rag" on several coats with a lintless cloth. Allow to dry 24 hours. **This stain dries lighter but shows up darker when finish is applied.** Rub lightly with steel wool after the piece has dried 24 hours. Dust with a dry cloth, and then with a tack rag.

Oil Stains

Oil stains are easy to use and usually are available. They are made from finely ground oil colors in a linseed oil base. Often called "colors in oil," they may be mixed with any material having an oil base.

Oil stains are intended for soft woods that absorb stains readily; they have little effect on hardwood. They may be used on fine-textured, close-grained and small-pored woods like basswood, poplar, and gum. They are also recommended for oak, chestnut, hickory, and mahogany, but may become clogged in the pores. An oil stain can be used on pine but darkens it.

Using color-in-oil stains lends a warmer, deeper tone than water stains. They may dim the grain somewhat.

You can buy oil stains ready to use

Ready-to-use oil stains are available in liquid form in different wood colors—walnut, maple, mahogany, oak, redwood, pine, and driftwood. Light and dark variations of each of these are also available. Any oil stain may be made lighter by thinning with gum turpentine. Or different colors may be mixed. Gum turpentine may be added to this mixture of different colors if a lighter tone is desired. Should a large amount of gum turpentine be used, a small amount of Japan drier should be added to insure proper drying.

You can mix oil stains yourself

Oil stains may be mixed easily and quickly at home. Often, more subtle tones may be obtained by mixing your own.

Colors in oil come in small tubes or cans in paste form. Remember that hues and intensities of different brands vary to some degree. See page 30 for colors.

To apply oil stains

Step 1

To be sure of an even coat of stain on soft wood, first use a lintless cloth to apply a coat of the following mixture:

3 parts gum turpentine
1 part boiled linseed oil

Wipe off with lintless cloth.

Step 2

Mix together:

3 parts boiled linseed oil
1 part gum turpentine
 $\frac{1}{2}$ part Japan drier

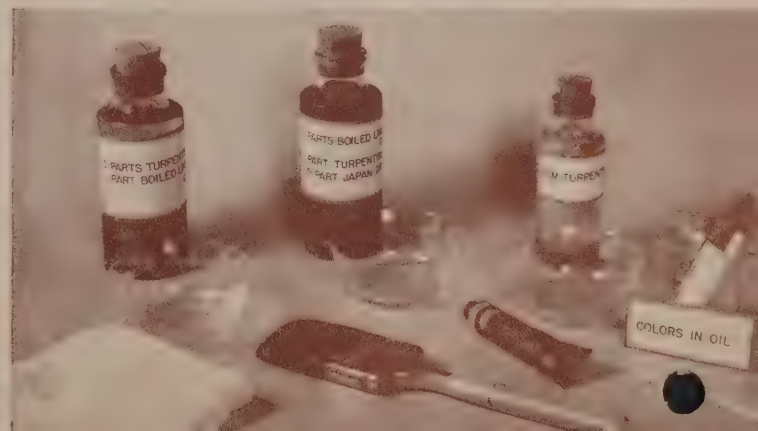
Add desired color in oil to the above mixture, amount depending on the tone desired.

Step 3

Wipe off surface with dry cloth. Then wipe with tack rag. (See page 27.)

Apply stain with brush or cloth and leave on long enough to let it penetrate and give the desired effect.

Wipe off before it sets hard. Dry for 24 hours and smooth lightly with 3/0 steel wool to remove roughness.



Mix colors in oil

Colors in oil that may be used in mixing oil stains to blend with colors of wood are:

Reds: Turkey red, rose madder, or rose pink; burnt sienna

Yellows: Raw sienna; yellow ochre

Browns: Burnt umber, Vandyke brown, raw umber

Black: Lamp or ivory

WALNUT:

Rich dark brown: 4 parts burnt umber
1 part Vandyke brown

Rich reddish brown: 4 parts burnt umber
 $\frac{1}{2}$ part burnt sienna

Yellowish brown: 3 parts burnt umber
2 parts raw umber

MAHOGANY:

Red: 3 parts burnt sienna
2 parts rose pink
 $\frac{1}{2}$ part burnt umber

Brown: 3 parts burnt sienna
1 part rose pink
1 part burnt umber

MAPLE:

Yellow: 3 parts raw sienna
1 part raw umber (to dull)

Red: 4 parts burnt sienna
1 part burnt umber (to dull)

Blend: 3 parts raw sienna
3 parts burnt sienna
1 part raw umber, or
1 part burnt umber

CHERRY:

Dark: Burnt sienna
Light: 3 parts burnt sienna
2 parts raw sienna

OAK:

Light: 4 parts raw sienna
1 part raw umber (to dull)

PINE (remember that oil stain darkens pine):

Pumpkin pine (warm, clear, brown tone)
Raw sienna
Small amount ultramarine

Honey pine

Yellow ochre
Small amount raw sienna

Note: One part will vary in amount from 1 tablespoon to 1 cup depending upon the size and number of pieces to be stained. Amounts also vary with the type of wood.

Other Types of Stain

Two other types of stains, non-grain-raising and spirit, are used by professionals but because they require a certain amount of speed and skill in their application, they are not usually recommended for beginners to use.

The alcohols used as solvents evaporate quickly causing these types to dry very rapidly. When applied with a brush, they dry in streaks but a smooth coat may be applied easily and evenly with a spray gun. Their ability to dry rapidly is advantageous in large quantity finishing by skilled workers using spray equipment. Non-grain-raising stains are fast to light and do not bleed. Spirit stains are usually used in patching or "touch-up" work, and in staining sap streaks. Spirit stains are so concentrated that too dark a stain results very easily. They may fade in strong sunlight.

PART IV

HOW TO RECOGNIZE SOME COMMON WOODS

Walnut and mahogany have pores that are easily seen with the naked eye. These look like grooves or dark lines, except on the end cut where they appear as tiny dots. Because wood shrinks as it gets older, the pores become smaller, and on old wood the lines are much finer than on newer wood. These two woods look much alike except that walnut is brown, mahogany is more red. The rich dark color of San Domingan mahogany was a favorite in the Chippendale period and again in the late Empire period. The mahogany of the Hepplewhite and Sheraton periods was a lighter and browner color. Walnut was the favored wood of the Queen Anne period and later of the mid-Victorian and late-Victorian periods. Some of it is a reddish brown in color, and that known as black walnut is a cold gray brown. White walnut, or butternut as it is also called, has grain similar to black walnut but is a light, chestnut-brown color.

Cherry and mahogany are often much the same in color, but in cherry the dark pore lines are either missing, or can just barely be seen with the naked eye. Cherry has a fine, hard texture. It is sometimes called "New England mahogany."

Rosewood, which comes from India and Brazil, is especially used in the better pieces of early Victorian furniture. You can recognize it by the black streaks running through the grain. It is heavy, has a fine grain, and takes a polish.

Gumwood is used with walnut in some modern furniture and can be stained to resemble walnut or mahogany. But it

can be easily recognized because it does not show the dark lines of the pores as do walnut or mahogany. Gumwood is soft, close-grained, and is of three kinds—sweet gum or red gum, which is light pink to warm reddish brown in color, black tupelo, which is grayish brown, and black gum which is light with a ribbon-like stripe. These latter two are very similar.

Birch, also widely used in modern furniture, is often stained a mahogany color or a red maple. It can be distinguished from mahogany because the dark pore lines do not show. It is a very hard, fine-grained wood.

Soft white pine was the most common wood used by the early settlers for simple household furniture. Though light in color when new, it turns to a warm brownish yellow with age. It has a close, very fine grain.

Sugar maple (hard), the wood most frequently used in the middle-class furniture of New England in the early days, has a hard, smooth texture. The pores cannot be seen without a lens. The color varies from very light in the outer sapwood to a reddish brown in the inner part of the log. The light sapwood was often used for inlay as a less expensive substitute for satinwood. "Curly" maple and "bird's-eye" maple come from trees in which irregularities in the fiber growth developed.

Poplar, often used in old, inexpensive washstands, tables, and on the inside of drawers, is a soft, yellowish-brown wood, often streaked with a greenish color. The grain is usually straight. It requires a stain. Poplar is called "white-wood" by some. Basswood (linden) and magnolia are also referred to as "whitewood."

ORDER OF STEPS IN REPAIRING AND REFINISHING WOOD

Remove hinges, handles, knobs, etc.

Remove the old finish

Repair if necessary

Remove dents, bruises, warped places

Replace or repair veneer

Repair small cracks

Reglue

Prepare wood for the new finish

Remove dark stains or freshen color of wood if necessary

Remove grease stains

Smooth surface with abrasives

Examine piece

Wipe surface with dry cloth and tack rag

Stain wood if necessary

Apply finish

Penetrating Wood Sealer Finish

Apply 2 coats of sealer, 24 to 48 hours apart

Fill holes with stick shellac

Apply paste wood filler to coarse grain open-pored woods

Apply remaining coats of sealer. Let final coat dry one week

Rub final coat with pumice and oil

Varnish, Shellac, or Lacquer Finishes

Apply paste wood filler to coarse, open-grained woods

Apply coats of finish. Let final coat dry one week

Rub final coat with pumice and oil, then rottenstone and oil



STANDARDS OF A NATURAL FINISH

A good natural finish will have a:

- Satin finish—even, satinlike luster over-all, amount depending on style and age of piece. Not glossy like varnish or lacquer, but a soft, mellow sheen that shows no apparent evidence of a finish having been applied
- Smooth surface—well sanded; pores of coarse-grain wood filled with paste wood filler; holes filled with stick shellac, with color blending with wood. No dust specks or bubbles; no dull spots; no blisters nor dripping of finish
- Dry, hard finish—not sticky, but with sufficient body to give good service
- Color—appropriate for the wood and style of piece

If the surface is:

- Sticky—it may be due to wax from varnish remover; grease or dirt; moisture in wood; some coats applied too soon
- Dull in spots—there may not be enough coats of finish
- Sticky or powdery when finger is rubbed quickly over surface until it is warm—a poor finish was used
- Rough—it may be caused by insufficient smoothing; finish not strained; particles of steel wool or dust not cleaned off between coats; steel-wool fragments not cleaned out of corners and crevices; too much pressure on brush if lacquer or varnish is used; too much stirring brush in varnish

Mahogany coffee table finished with a thin type of sealer that is resistant to water, alcohol, acid, heat, and abrasion.

NATURAL FINISHES

Penetrating Wood Sealers

Penetrating wood sealers are being used increasingly in homes on floors, walls, and on furniture where there is natural beauty in the grain and color of the wood. They are used also where a natural, hard, durable, and tough finish is desirable.

Advantages

- Easy to apply—Sealers are especially good for the beginner to use in refinishing because they require less skill, time, and equipment than does varnish. They may be ragged on with a lintless cloth (old nylon hose, or nylon or rayon garments), which can be discarded after use, eliminating the need for a paintbrush
- Quick-drying—Do not collect dust as does varnish
- Resistant to scratching and injuries—Resistance to abrasion is partly due to the tough, elastic quality given by tung oil—also called china wood oil—or synthetic resins usually used as a base in wood sealers. Penetrating wood sealer finish, like oil finish, **sinks into** and **seals** the pores of the wood, fills the cavities of the wood cells, and saturates the surface. It becomes a part of the wood rather than building up a thick glossy coating on top of the surface as varnish does

Surplus sealer must be removed each time it is applied. Otherwise, a glass-like coating will form on the surface, which will scratch easily

- Most sealers resist moisture and abrasion. Others are resistant to heat, acids, alcohol, etc.

To be entirely resistant to moisture, the underside edges and ends of table leaves, insides of drawers, etc., should be finished with several coats of sealer

- Easy to patch—Worn places in the finish may be patched without showing lapping around the edges which ordinarily cannot be done with other types of finishes

How to Choose a Sealer

The type of sealer you buy will be determined by the type of finish you want. Each sealer is intended for specific purposes and should be chosen and used as the manufacturer recommends. **Read the label carefully.**

There are two types—those containing varnish and those with wax. Usually, the former type is used on furniture. Sealers are available in three consistencies—thin, medium, and heavy. The thin is recommended for use in homes while the medium and heavy are used on surfaces that get extremely hard wear, such as gym floors. The **thin type of sealer** has been found to go on more smoothly with less “piling up”, especially on close-grained woods in furniture.

Penetrating sealers are commonly available only in the clear finish, but some are made in such colors as oak, pine, maple, walnut, and mahogany. It is possible to get almost any color by having on hand a yellow brown (oak, pine, or maple) and the darker colors (walnut and mahogany). The color may be lightened by adding a clear sealer of the same brand.

When colored sealers are not available, color may be added to a clear sealer to change the tone. Colors in oil or colored varnishes may be added to the sealer. Oil colors may be used but are less desirable. A more natural wood color is obtained if the piece is stained first and then finished with a natural penetrating sealer (that is, if stain is needed).

Before applying a coat of finish



Wipe off surface with a cloth.



Wipe off surface with tack rag to remove dust that an ordinary cloth does not remove.

To Apply Sealer

The method of applying penetrating wood sealers is as important as the choice of a sealer.

First coat

Apply 24 hours after staining is done, if staining is necessary.

Wipe piece with tack rag. Strain sealer. Apply with clean nylon hose. **Immediately smooth off excess not absorbed by surface.** Let dry 24 hours.

Succeeding coats

Rub surface lightly with 3/0 steel wool. Wipe with dry cloth and then with tack rag. Apply sealer as you did for the first coat. Continue to apply coats until no dull spots appear.

To obtain an even, satin-like smoothness and a hard finish, apply

3 to 5 coats on chairs and legs of any piece

About 9 to 21 coats on dining and coffee table tops, depending on the amount of smoothness desired and the use to be given the surface

Let final coat dry 1 week. Rub with pumice and oil.

Strain sealer through clean, old nylon hose into clean dry container.



EQUIPMENT

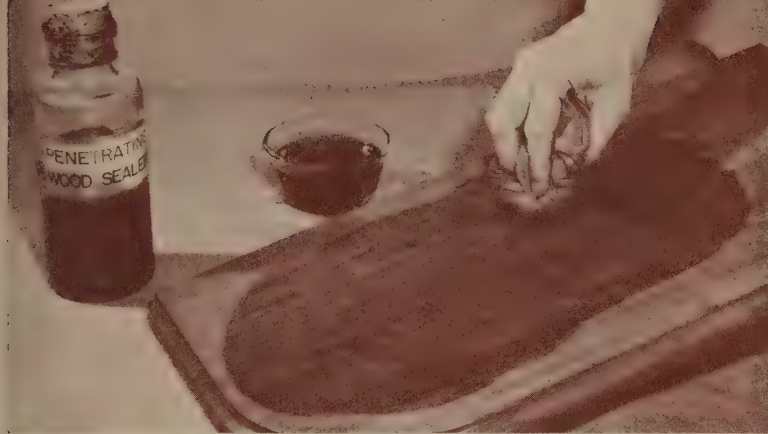
Penetrating wood sealer, and a dish to hold it

Old nylon stocking or rayon or nylon garment

Tack rag

Lintless cloth

3/0 steel wool to smooth surface after sealer coat is dry



Apply sealer with another clean nylon hose. Use circular motion and apply across the grain.



Smooth all the surplus off immediately with the grain before putting sealer on another section.

Apply sealer to underside of table leaves and to inside of drawers. If insides of drawers have been waxed, remove with a cloth dipped in gum turpentine. Steel wool helps, too.

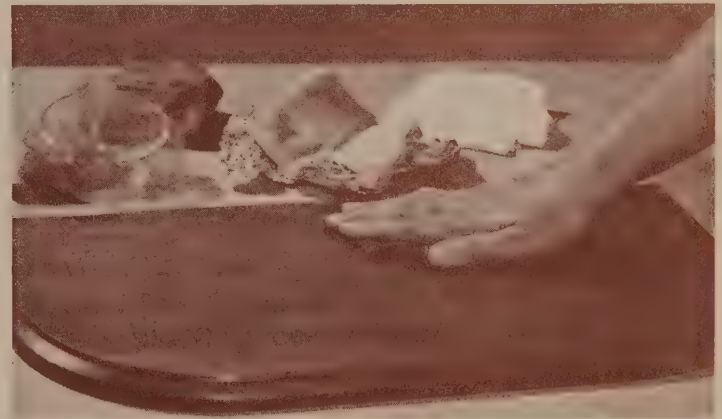


Apply sealer to rungs, one rung at a time, with clean nylon hose. Wipe surplus off immediately with hands.



Wipe surplus from edges and carvings with fingers.

Caution: Do not let a heavy glasslike coating build up on the surface. Wipe off any excess not absorbed on the surface. Allow to dry 24 hours.



Smooth surface with 3/0 steel wool before applying next coat, to remove bubbles and "make tooth" for the next coat.



EQUIPMENT

- Lintless cloths
- Old stiff-bladed knife
- Single-edge razor blade
- Old screw driver
- Old toothbrush
- 3/0 steel wool
- Denatured alcohol
- Orange stick
- Can of canned heat
- Matches
- Smoothing block
- 500-A wet or dry silicon carbide paper, or 6/0 garnet paper used dry



A stick of clear and one of opaque shellac as similar to color of wood as possible, fastened together with masking or adhesive tape

Fill Small Holes with Stick Shellac

Use stick shellac to fill small holes in surfaces that have a natural finish. This may be done easily at any stage after the second coat of finish is applied and is thoroughly dry. The reason for filling the holes at this stage is to enable you to blend colors of stick shellac with that of the wood. Coats of a natural finish bring out the true color in the wood. It is easier to fill holes on a partly finished or finished surface than on an unfinished one.

Opaque and transparent stick shellac are available in light, medium, and dark shades of many wood colors.

Use spackling compound or a wood-forming plastic to partially fill large holes. Stick shellac is melted into the top half of the hole.



Before filling with stick shellac, remove dark edges from old holes with steel wool wrapped around orange stick. To remove dust, brush out hole with old toothbrush or nailbrush.



Heat screw driver over canned heat.



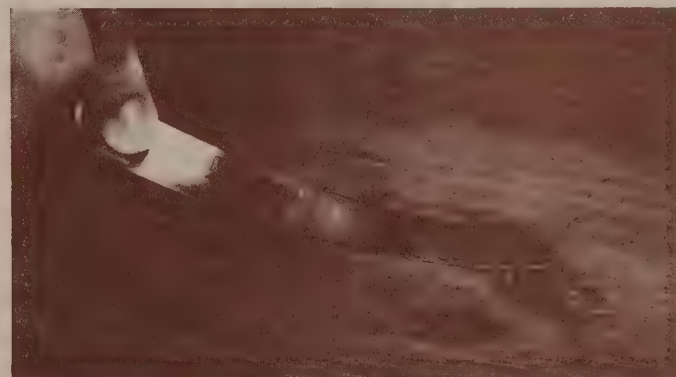
Drop soft shellac into hole or place it there with point of screw driver or knife, a drop at a time. (If screw driver is too hot, bubbles form and finished surface will be full of holes.)



Press drop of shellac firmly with wet finger.



Remove char from screw driver by rubbing it on a steel-wool pad. Wipe off with dry cloth.

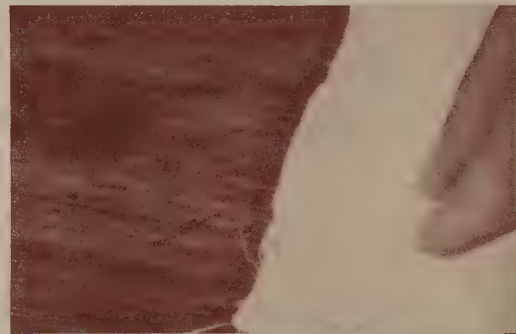


Heat knife; wipe off char on steel wool, then on a dry cloth. Melt and level shellac with hot knife. Feather out edges of shellac by rotating knife.

Repeat process until the shellac stands up only slightly higher than the surrounding area.



When shellac is hard, hold a single-edge razor blade flat or at right angles, and gradually shave off raised portion until patch is level with wood.



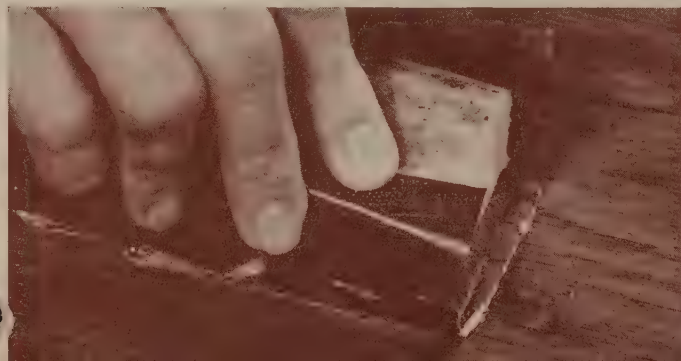
When shellac is hard, rub with 3/0 steel wool, wipe off with dry cloth, and then with tack rag,

OR

Dip 500-A wet or dry abrasive paper in a warm mild-soap solution. Wrap around sanding block. Smooth shellac-filled hole. Wipe off with cloth moistened in clear water, then with a dry cloth.



Remove shellac remaining around edges with lintless cloth dampened in denatured alcohol. Care must be taken not to soften shellac in hole. Shellac takes quite a while to harden.



Apply Paste Wood Filler to Open-Pored Wood

Mahogany	Chestnut	Oak
Ash	Elm	Walnut

Paste wood fillers are used to make an extremely smooth surface; to fill pores of wood; to make pores flush with surrounding area; to prevent clogging of pores with dust. They are made of crushed, finely ground rock quartz called silex, which is similar to glass in that it is transparent, with linseed oil and Japan drier added.

When to use

Twenty-four hours **after** a stain is applied, if stain is required, and **after** two coats of sealer. Or add as needed between dry coats of sealer

Before varnish or shellac is applied

Where available

In paint and hardware stores in 1-, 5-, and 15-pound cans under the name of "wood filler." Many people prefer to buy natural paste wood filler (grayish) and add colors in oil to blend with stain used and the wood.

Paste wood fillers are also available in white and the following colors (they may be bought colored and mixed):

- Light and dark golden oak
- Light and dark walnut
- Brown and red mahogany

Mix paste wood filler

Thin paste wood filler with gum turpentine to proper brushing consistency. The filler should be fluid enough to sink to the bottom of the pores and fill them. It should be remembered that as wood ages, the pores shrink in size. Therefore, a thinner paste wood filler probably should be used on some old woods. Do not use wood turpentine instead of gum turpentine as it causes a cloudy finish.

For woods with large pores and coarse texture

Philippine mahogany, oak, chestnut, hickory, sycamore, elm, ash: filler should be thick or heavy like thick paint.

For woods with medium-size pores

Walnut, mahogany, beech: filler should be medium heavy, like thick soup.

Add colors in oil

Wood filler should be darker than wood in the pores or stain since it dries lighter. Pores will appear gray if filler is too light in color.

Add gum turpentine to small amount of color in oil and mix well before adding color to paste wood filler. Thoroughly stir color into filler.

See page 30, for colors.

EQUIPMENT

Paste wood filler
Stiff brush to apply (cut off ½ inch of bristle)
Gum turpentine
Small covered dish or jar to mix and store filler
Stirring stick

Measuring spoons for measuring oil colors
Burlap to wipe off paste filler. Burlap should be washed and cut large enough to cover smoothing block
Small wooden block to use in smoothing
Newspapers for floor and table or other working surface

To apply paste wood filler

Apply filler generously with short-bristled stiff brush

First, across the grain; pack it into pores.

Then, repeat, smoothing it. Drag brush across grain.

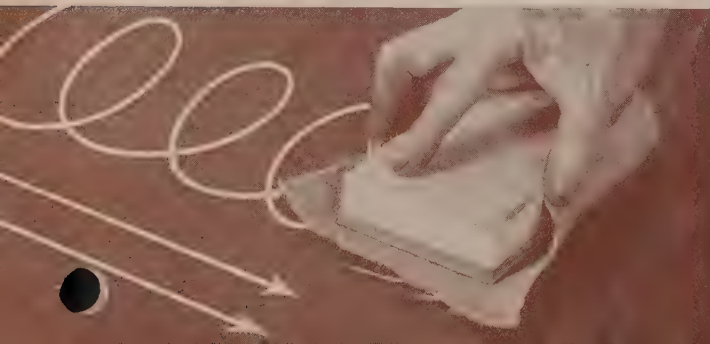
Stir filler before each application.



When gloss has disappeared in spots and filler looks flat, wipe it off with a piece of burlap (if surface is wide, use a smoothing block with burlap).

Do not wait until entire surface has dulled to begin rubbing off. Rub first in a swirl, and then across the grain.

Clean off enough filler to prevent a streaked, cloudy finish. Use clean pieces of burlap under smoothing block.



CAUTION: Filler should not be allowed to dry on. It dries to a hard glasslike consistency and is very difficult to remove. Gum turpentine and 3/0 steel wool aid in removing it from a surface.

Filler may have to be applied two or three times to make a perfectly smooth surface. Each additional application should be thinner than the first and each coat allowed to dry 24 hours before applying other coats.

Rub 3/0 steel wool or smooth with 6/0 abrasive finishing paper, dust with dry cloth, then with tack rag.

Apply Remaining Coats of Sealer

Third coat of sealer and succeeding coats

Five coats are usually desirable on furniture to get an even, satinlike luster and a finish with a smooth surface and enough body to give good service. Dining table leaves, however, require more coats. Apply enough coats so that no dull spots appear. Let last coat of finish harden one week.

Sealer may be colored

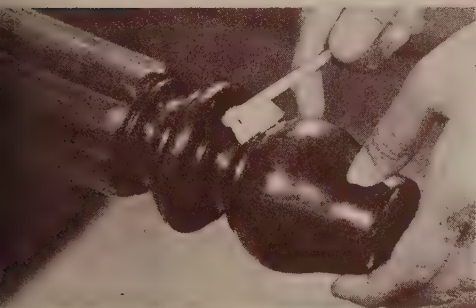
If you want to change the tone of the finish at this stage, a colored sealer may be applied. Colors in oil, colored sealer of the same brand, or colors in varnish may be added to a clear sealer. Or a sealer may be bought in a wood color and applied as it comes from the can. It may be lightened by adding clear sealer of the same brand.

Final Rubbing with Pumice and Oil

Final coat should be applied and allowed to dry one week before rubbing with FFFF powdered pumice stone and a lightweight oil.

Small pieces—hand-rub final coat

Mix finely powdered pumice and oil to the consistency of thin cream. Keep stirred while using. Rub on with the pads of your hands, with the grain of the wood until a smooth, even, satin luster finish is obtained. Try to keep amount of rubbing equal on all parts of the surface so that some parts will not be duller than others.



Thoroughly clean out pumice from cracks and crevices with soft, dry brush and dry cloth.



EQUIPMENT

Pumice stone FFFF or 4/0

1 pint lightweight mineral oil or paraffin oil

Mixed pumice and oil may be stored in a container. Stir well before using.

Spoon

Plenty of clean lintless cloths

Felt pad such as a blackboard eraser for rubbing large areas

Jar to hold pumice oil for final rubbing

Saucer to pour oil into

Brush to clean out crevices

Large surfaces—rub with a clean blackboard eraser

Sprinkle pumice lightly over surface. You may use a salt shaker or your fingers. Pour oil into a saucer.





Dip eraser into oil, rub with grain of wood.



Wipe off with dry cloths until an even dull luster is obtained and finger marks are removed. Thoroughly clean pumice from cracks and crevices with a brush.

Oil Finish

An oil finish develops the richness in the wood color and is considered by many to be the most beautiful of all finishes. It should be used, however, only by those who have enough patience and "elbow grease" to apply many coats of oil and turpentine and to do a great deal of rubbing. The oil finish is particularly desirable for table tops and furniture that may be easily spotted and scratched, because, if properly done, the wood is impervious to water, heat, and scratching. If sufficiently oiled and rubbed, this finish needs no waxing. An oil finish should not be used on elaborately carved woods, as it is too difficult to keep clean and to develop a polished finish.

The piece of furniture may be used during this process of finishing, which may take several months or even a year to complete.

To apply oil finish

Smooth surface, wipe with dry cloth, then with a tack rag. Apply oil mixture hot or cold on plain surfaces, **but it is wiser to use it cold on carved or grooved parts where there is danger of its setting too quickly.** The hot oil penetrates the wood more quickly than does the cold oil and brings out a richer color. Oil should always be heated in a double-boiler to prevent danger of fire.

Apply the oil generously with a soft cloth and then rub it into the wood until the wood has absorbed all the oil it can. This takes from 5 to 20 minutes, depending upon the condition of the wood and the temperature of the oil and of the room. With several changes of cloth, all excess oil is wiped off. Take care to get all traces of oil out of the crevices; otherwise, the oil will harden like a varnish or become sticky and will then need to be removed with varnish remover.

Next, each part of the piece is well rubbed from 10 to 20 minutes with the polishing cloth. A linen cement bag or grain bag is excellent for developing a polish, as the friction of such material produces heat. A woolen cloth also may be used. The rubbing is essential to bring out the luster. From four to twelve coats of oil are needed to bring out a luster that gives a soft satiny effect. Each coat must be thoroughly soaked into the wood before another coat is applied.

Drying time between coats of oil

- In dry warm weather
 - 2 days, at least, between first and second coats
 - 1 week between remaining coats
- In moist weather
 - 1 week, at least, between first and second coats
 - 2 weeks and progressively longer between remaining coats

More time should be allowed between each successive coat. This process is repeated until no dull spots remain; it should also be repeated once or twice a year to keep the furniture in good condition. Table leaves should be oiled on the underside as often as the top is oiled, to prevent warping.

If the grain of the wood is raised with the oiling, it may be rubbed smooth with steel wool. Oil that has hardened in the cracks may be removed with varnish remover. A sticky surface is an indication that the oil has not been thoroughly rubbed off. If the surface is oily where the hand has been held for a few minutes on the wood, it is not dry enough for an additional coat.

Danger: Oiled rags are easily combustible. Immediately destroy them or wash them if you plan to use them again.

Soft rags without lint

A mixture of $\frac{2}{3}$ boiled linseed oil and $\frac{1}{3}$ turpentine

Polishing cloth (linen grain or cement bag or a woolen cloth)

For quicker results this oil finish may be tried:

- 1st coat: $\frac{1}{3}$ raw linseed oil
 $\frac{2}{3}$ turpentine
 Allow 24 hours to dry
- 2d coat: Pure **boiled** linseed oil
 Allow 24 hours to dry
- 3d coat: Pure **boiled** linseed oil
 Allow 24 hours to dry
- 4th coat: $\frac{1}{2}$ **boiled** linseed oil
 $\frac{1}{2}$ Japan dryer

Watch **closely** for any tackiness: rub off with washed burlap. Finish with pumice and oil and steel wool.

Shellac Finish

Thin shellac to the consistency of milk with equal parts of denatured alcohol. Apply with a brush. This thinness prevents brush marks showing. Both white and orange shellac are available. White is used on light woods, orange on dark woods. Either may be used alone or may be mixed.

Buy fresh shellac in small amounts. Old shellac usually will not dry on a surface. Throw out shellac if it has been kept as long as six months.

Moisture and liquids turn a shellac finish white. It is easily marred by scratches.

Varnish Finish

A varnish finish is the most difficult for a beginner to use. Three coats are needed to get a good finish. When buying varnish, read the label carefully to see if the product is proof against water, alcohol, heat, or acid.

For good work, these requirements are important

- Never varnish in damp weather.
 - Prevent dust particles from settling in the slow-drying varnish. Just before varnishing, wipe the piece with a slightly sticky tack rag which picks up the fine particles that a dry cloth cannot get.
 - Use a perfectly clean brush. The varnish should also be free from dirt and skin particles. Keep the varnish warm, and work in a warm room (70° F.). Pour out just the amount that will be used at one time, or for part of the work if the job is large. Place the dish of varnish in a larger one containing warm water so that the varnish will thin with the heat and will spread smoothly.
 - Work in fresh air but not in a draft, and see that the piece is left to dry where there is good circulation of air to aid in the drying; a corner or edge of a room is likely to contain dead air.
 - Let each coat dry thoroughly before rubbing it down. Allow three days for the first coat, a week for the second, and two weeks for the last.
- If the piece needs to be stained first, see page 27.
- If a piece is open-grained and needs to have the pores filled before varnishing, see page 39.

To apply varnish finish

Dip the brush in varnish. Brush it back and forth on clean paper to get varnish through the bristles evenly. Fill the brush with varnish, scrape the excess from one side on the edge of the dish, and place the full side face down on the surface to be varnished.

Varnish sets quickly, so work fast with long, even strokes. Hold the brush so all the tip ends of bristles touch the surface. Use an easy wrist motion and hold the brush at a low angle so all the flag ends leave the varnish they are holding. Do not use pressure on the brush, because it causes bubbles to form in the varnish being applied.

Spread a thick coat over a small area, brushing quickly both with the grain and across it. Don't skip any spots. Follow construction lines to apply and finish off varnish. For turned parts, like the leg of a chair, strokes can go around turnings, but on large areas make strokes lengthwise. If there is danger of an edge of board scraping off varnish from a full brush as you start, stroke from the center outward.

To get a drier brush for picking up the excess and "tipping off," wipe both sides of the brush against the edge of the dish. "Tip off" the surface to remove any bubbles. Hold the brush straight up and down. Lightly go over the surface with long strokes, touching surface only with the tip of the brush. After each tipping-off stroke, scrape off the varnish picked up so the brush is always fairly dry. On a large area, where one stroke will not cover the distance, start at the edges and end strokes at the center so there is less danger of strokes showing where they join. For panels, take a short stroke at each end and a long one in the middle.

Between first and second coats

Smooth the varnished surface with 500-A waterproof paper dipped into lukewarm, soapy water. Next, wash the surface with a cloth dipped into clear water. Dry it with a chamois or clean dry cloths. Another method is to use pumice powder mixed with water, then clean it off, and dry the surface thoroughly. Final coat is rubbed with pumice and oil, as for final sealer coat.

Lacquer Finish

Apply paste filler first. If a very clear finish is desired, a water white lacquer may be used, applying two or three coats and using an abrasive between coats. Some lacquers may be brushed on. Others are more successfully sprayed on. A "rag on" lacquer finish is also available. Follow instructions on the label.

BLOND FINISHES

For a blond finish, use one of the following methods on bare wood:

1. **Bleaching** (smooth with abrasives after bleaching)
2. **Masking with oil stains** (smooth with abrasives before staining)
3. **Masking with thin coat of paint** (smooth with abrasives before applying paint)
4. **Filling pores with paint or paste wood filler for a limed effect** (smooth with abrasives and apply two coats of sealer before filling pores)

Finish coats must be applied after using one of the above methods.

Bleaching

Bleaching wood with a commercial bleach is not always necessary to obtain a blond finish. Some dyed wood such as dark mission oak may not respond to this treatment. However, ash, light oak, or chestnut may be successfully bleached if directions on the container are followed carefully.

Bleach may be purchased in paint stores; ask for solutions No. 1 and No. 2. Follow directions on these bottles carefully. A strong bleach injures the fibers of old wood and bleaches out any natural coloring. More than one application may be needed; if so, be sure that each coat is thoroughly dry before another application is made.

Masked Effect Using Oil Stains

A simple way to get a lighter tone on wood without bleaching is to apply a blond stain, such as gray wood, drift wood, or smoke wood, which can be bought ready mixed. Follow manufacturer's directions. This stain is of a very thin consistency, is opaque, and is available in colors.

Mask Surface with Wash Coat of Thin Paint

Another easy way to obtain a blond finish is to use a white resin primer (first coat) such as white firzite as recommended for fir and other plywood. Or you can mix your own primer: One part thin type sealer or turpentine to four parts flat or semi-gloss enamel paint—white or light color thinned with gum turpentine. You can tint the flat white with colors-in-oil or tint the enamel with colors-in-Japan or a colored enamel.

Apply the thin wash coat with a brush or spray gun. Allow it to remain on about five minutes. Rub off with a coarse cloth like burlap over a block of wood in a swirl across the grain and then with the grain until the surplus is removed, the grain stands out, and only a thin uniform film remains.

Apply Finish Coats after Bleaching or Masking Surface

Allow surface to dry 24 hours. Smooth with 3/0 steel wool. Wipe with a dry cloth, then with a tack rag.

Apply finish coats of water white lacquer or a natural penetrating wood sealer. Use a brush or spray gun for the lacquer.

Limed Effect Using Paint or Paste Wood Filler

Limed finishes are successfully obtained on coarse open-grained woods like oak, chestnut, or ash and even on mahogany and walnut. Paint or paste wood filler is left in the pores and grain only. Coats of a thin type natural sealer are applied *before* and *after* filling pores with paint, to impregnate the wood with the finish and to prevent discoloring the area around the pores. If a lacquer finish is used, apply paste wood filler or paint first.

Limed Oak or Chestnut, or Heather Mahogany

Apply two coats of a thin sealer 24 hours apart. After the last coat has dried 24 hours, smooth with 3/0 steel wool. Dust with a dry cloth, then with a tack rag.

Fill pores with white firzite, white lead, or colored or white paint or paste wood filler.

Apply white lead mixture, white firzite, white paint, or white paste wood filler (may be colored with colors in oil) with a stubby brush or with a folded lintless cloth, rubbing across the grain. Apply only enough white to fill the pores.

When paint reaches the tacky stage, rub off surplus with a circular motion and then crosswise, using a smoothing block covered with a coarse cloth. The

circular motion prevents streaking. See page 40, for removing paste wood filler.

When paint or filler has dried 24 hours, smooth with 3/0 steel wool with the grain until all of the paint is removed from the surface. Sometimes a cloth which has been sprinkled with turpentine and folded is used to remove this surplus paint. Paint should be in pores and grain only. It may be necessary to fill the pores again until they are flush with the surface.

Apply remaining coats of sealer.

Harvest-white Mahogany or Oak

Apply two coats of thin sealer as above.

Fill pores with natural paste wood filler tinted lightly with raw sienna.

Apply remaining coats of sealer.

BRUSHES

Selection

A varnish brush is wedge-shaped. A good one is made with a "chiseled" shape, that is, the bristles on the sides are short. These "flags" hold the varnish and spread it more smoothly than does a brush with bristle ends all of one length. For chairs, a 1-inch or 1½-inch brush is good; for large areas, a 3-inch or 4-inch brush is needed.

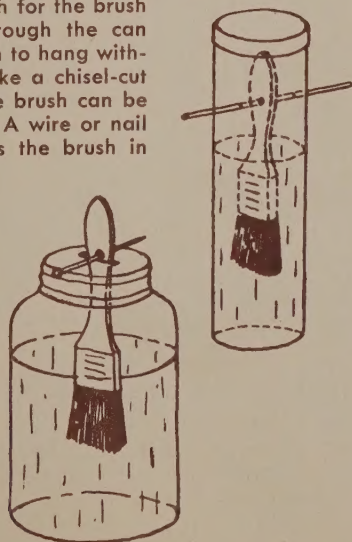
Care

A new brush almost always has a few loose hairs that should be removed before you use it. Rub the bristles back and forth across your hand. This also removes dust. Wash a new brush in a cleaning fluid, such as carbon tetrachloride, which evaporates quickly and will not catch fire.

Cleaning

Before you dip the brush into the cleaning fluid, wipe off any excess varnish with a cloth, or brush it out on a piece of paper. All varnish or paint must be removed from a brush or it will harden in the bristles. Then the brush will never be free from little specks of dried varnish that will get into new work. The brush may be cleaned in from three to five jars of cleaning fluid, used one after another, until the fluid is absolutely clean. The cleaning fluid should be kept in glass jars with covers that do not have rubber inside, because the rubber softens and drops into the liquid. When the brush is dry, wrap it in aluminum foil and store it on a flat surface.

To keep a brush for frequent use, make a holder from a tin can tall enough for the brush to be enclosed. Bore holes through the can and the brush to permit the brush to hang without touching the bottom. Or make a chisel-cut in the screw top of a jar, so the brush can be put through it and air kept out. A wire or nail through the brush handle holds the brush in position.



WAXES AND WAXING

Hard, glass-like, on-the-surface finishes such as lacquers and varnishes need wax for protection in order to resist some abrasion. A finish such as a sealer, which is impregnated into the wood, does not necessarily need wax.

A hard wax such as carnauba wax is considered more durable than those made chiefly of soft wax such as beeswax or paraffin. Some of the carnauba waxes are waterproof.

Information on the label should be read carefully, especially the very fine print, to find out if it is a hard wax. If the label does not contain this information, you will have to rely on

HOW TO CLEAN BRUSHES

Brushes Used in:	May Be Cleaned with:
Lacquers	Lacquer thinner
Paint Enamels } Flat paint } Rubber base }	Commercial brush cleaner; turpentine or paint thinner; soap and warm water Soap and warm water
Paste wood filler	Turpentine; soap and warm water
Removers (paint and varnish) Shellac	Denatured alcohol; soap and warm water
Stains Spirit; non-grain raising Oil Water	Denatured alcohol Turpentine; paint thinner; soap and warm water Soap and warm water
Varnish	Turpentine; paint thinner; soap and warm water

your dealer to recommend trade names of a hard carnauba base wax for furniture.

Waxes are now available in wood colors. However, yellow or natural wax may be colored with colors in oil—burnt umber or Vandyke brown and sometimes a bit of burnt sienna if the wood has a reddish-orange tone. Natural colored wax dries almost white and shows.

Another important consideration in the selection of a type of wax is whether it has a solvent base such as turpentine or a water base. Those having a solvent base may be used on wood if the label on the container so indicates. Follow the manufacturer's recommendations carefully.

When you buy wax, you also have a choice among paste and liquid types. The liquid types are easier to apply; however, a paste type produces a finish that lasts longer, provided it is applied properly.

The method of application is important. The wax and the piece to be waxed should be at room temperature, about 70° F. Often it is desirable to remove previously applied wax. Dampen a coarse lintless cloth with gum turpentine and wipe the surface. Next use a dry lintless cloth to wipe the entire surface. Some commercial floor cleaners and wax removers may be used instead. Apply a thin coat in a circular motion. Directions on the container indicate the length of time the wax should dry before it is buffed. Usually it should be polished before it has hardened. Otherwise uniformity and evenness in polishing is difficult. Buff with the grain, using a woolen cloth, "shoe-shine fashion," on edges, etc. On a wide flat surface, a brick could be placed inside the woolen cloth or an old piece of carpet. **Heat generated by buffing a thin coat of wax hardens it.**